DOCUMENT RESUME

ED 096 294 SP 008 424

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TITLE Let's Teach Students To Think.
NOTE 10p.

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Critical Thinking; Logic; *Students; *Teacher Education; *Teacher Influence; *Teacher Role

ABSTRACT

This paper focuses on the need to teach students essential techniques in developing concepts and relationships rather than teaching them merely to digest isolated facts. The characteristics of a critical thinker are described (a) securing appropriate information, (b) appraising the evidence obtained through the use of logic and reason against previously defined standards, (c) coming to a valid conclusion, and (d) acting in respect to that conclusion. The author states that emphasis on the stimulation and improvement of critical thinking requires selection of materials that are relevant to students' interests and that if teaching for thinking is to flourish and have impact on schools, individual classroom teachers are the key to the effort. The teacher's role in developing critical thinking skills and ways to exert influence over students' thinking ability are discussed. In conclusion, the author states that thinking is the best method of problem solving and recommends that teacher training institutions emphasize critical thinking and prepare teachers to teach critical thinking. A 12-item bibliography is included. (PD)

ED 096294

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LET'S TEACH STUDENTS TO THINK

In our present-day society of high speed technological advancement and rapidly occurring changes it is no longer adequate nor expedient for the schools of our nation to use teaching methods designed to facilitate a lockstep curriculum with the limited and limiting objectives of acquiring a body of facts having as a p.. mary goal the preparation of students for the accommodation of t.. bsequent grade level.

As specialization and the concomitant body of factual knowledge continually increases, it has become imperative that our schools help students learn essential techniques in the developing of concepts and relationships rather than merely digesting isolated facts. We are growing beyond the time when a single individual can meaningfully assimilate all he must know on a factually limited basis.

One of the distinct characteristics of man is his capacity to reason and make use of his experiences; the development of this capacity into ability should be the focus and end in all education. Whatever integration of knowledge is possible for a given individual takes place only in the mind of that individual -- the extent to which this is possible depends on the ability of an individual to think and to think critically.

Critical thinking appears to be a universally accepted objective of education even though it is more accepted than actualized in curricula content, we nevertheless are frequently unclear as to what we mean by it. Critical thinking definitions seem to encompass some or all of the following characteristics: (1) the use of scientific methods including emphasis on evidence, (2) a tendency to be inquisitive, critical and analytical

in regard to issues and personal behavior which includes a lack of susceptibility to propaganda, and (3) the use of correct principles of logic. (Wallen, 1963) Some specific abilities included in the general concept of critical thinking would be the ability to define a problem, to select pertinent information, to recognize stated and unstated assumptions, to formulate and select relevant hypotheses, to draw conclusions validly, and to judge the validity of inferences.

There are innumerable definitions of critical thinking and characteristics attributed to a critical thinker; several commonalities in these definitions and characteristics emerge and are reducible to (1) skill in securing appropriate information, (2) appraising the evidence obtained through the use of logic and reason against some previously defined standard, (3) coming to a valid conclusion or judgment, and (4) acting in respect to that conclusion or judgment.

Can Students be Taught to Think Critically?

What is needed is to turn educational activity upon the objective of developing thinking abilities on the part of students. We can no longer assume that this is an automatic consequence of having students repeat what others before them have thought. Knowledge is a necessary ingredient of the thought process; it does not generate thinking by itself, for thinking and thinking critically is a distinct form of behavior and has to be learned. Every individual is continually faced with the task of making choices which require thought and judgment. They not only require knowledge but demand the placing of that knowledge in a meaningful

context. A person cannot think about a problem which he is unable to grasp, nor is he likely to think very long or very seriously about one with which he has no concern. Emphasis on the stimulation and improvement of critical thinking requires selection of materials which are or can be relevant to the students' interest and concerns. The capacity to think is present in children; what is needed most are opportunities for and experience in thinking on the level of the individual student.

Thinking includes several mental processes; some of these, especially the lower processes of recall, recognition, and association receive extensive practice from elementary school through college; the higher mental processes which we call thinking and reasoning seem to receive only occasional and incidental stress. By many, they are looked upon as by-products of the lower processes. One often hears -- the facts come first and thinking comes second. Correctly understood, thinking is a means of acquiring facts, relevant facts. Higher mental processes are strengthened as there is a focus on the higher processes; rather than a loss of content, there is gain. Exposure to years of teaching which focuses on lower processes conditions the mind to uncritical acceptance. "The teaching of facts and gathering of information is properly seen as a response to thinking -- it is the process that is important, not the conclusion as such." (Raths, 1967, p. 47) The teacher who teaches with an emphasis on initial thinking must be aware of the differences between process and product in relation to education. The process is the experience that the student goes through as he learns; it is an on-going, uneven, psychological kind of activity about which too little is known, because it functions in the mind of

the student. The product is the end result or answer and is definite, tangible, and relatively easy to identify. The assumption is often made that when a student can answer a question correctly, he has learned what has been taught. There are times when this assumption is not valid. (Raths, 1967)

Several symptoms of behavior which reflect inadequate experiences with thinking are impulsiveness, over-dependence on the teacher, inability to concentrate, missing the meaning, dogmatic and assertive behavior, rigidity and inflexibility of behavior, extreme lack of confidence in one's own thinking, and unwillingness to attempt to think. Children whose behavior demonstrates inadequate thinking behavior is usually the result of practicing these habits for a long period of time. To change these habits will require a cooperative venture that will take much time. It requires a continuing exposure to thinking situations along with the thoughtful, friendly, patient work of a competent teacher. (Raths, 1967) A teacher who possesses these qualities may experience frustration unless he is familiar with materials and practices which relate to the thinking process. It is the integration of the two which promises most in terms of change in students' thinking behavior.

Who Can Best Teach Students to Think and to Think Critically?

If teaching for thinking is to flourish and have impact on our schools, individual classroom teachers are the key to the effort. If the shaping of intellect which leads to critical thinking is dependent upon the sort of social and intellectual stimulation impinging upon the child, then the models placed before him become all-important -- the model of the teacher as a thinking person and the model of thought

embodied in the curriculum. To teach for effective critical thinking, the teacher must possess a working knowledge of logic -- this is more than would be acquired through incidental learning. The claim that the teacher should be trained in logic rests upon two premises: (1) it is important to develop the students' abilities to think critically and (2) in order to develop these abilities the student must be given experience in controlling his own thinking under the guidance of the teacher. When teaching strategies ignore creating models for critical thinking, children tend to acquire faulty or unproductive conceptual schemes with which to organize information or solve problems. For example, asking students to name important cities without developing the criteria or model for "important" leads students to adopt irrational, unproductive, and arbitrary models of thinking and a dependence on memory rather than judgment or inference. It is much more important and valuable to help students develop a basis for and a method by which to judge the importance of cities than their simply knowing which are important. Without a teacher model illustrating methods by which to judge, children too often learn an unproductive model of thinking or a set which usually excludes real understanding of the problem.

As teachers emphasize critical thinking in their teaching, changes take place in the thinking-related behavior of students. In order to concentrate on thinking, teachers, by design, must provide opportunities for thinking each day. It is not enough just to be more aware of thinking operations and to use them once in a while, by chance. The best results are obtained when thinking is emphasized in connection with the subject matter under study. There need be no special time for thinking or special course of study for thinking; thinking must become an integral

part of the curricula and a part of the techniques used in teaching. It is an on-going process and should not be turned on or off according to a time schedule or specific textbook. Like moral and spiritual values, critical thinking cannot be taught out of a contextual framework and should be taught by example. Teaching for thinking means that the students actively do the thinking -- the object is not for students to learn about thinking but for the students to be given opportunities for thinking.

Biologically, psychologically, historically, linguistically, and artistically man does not receive raw materials through the senses and then try to make meanings of them through the mind. Rather, the meanings that he makes, tentative and provisional as they may be at every stage, lead him to look for materials of experience which will test his meanings. So the student does not need to have his mind stuffed with the so-called facts before he can be responsible for a tentative statement. "To think for oneself" becomes redundant when one considers that thinking has to be for oneself, or it is something else. Thoughts and ideas cannot be transferred from one mind to another, only facts can be so transferred. Though some teachers might imagine they are teaching for thinking by teaching someone else's thinking, they are actually teaching a product of someone else's thought.

Teachers can teach children to think critically by (1) becoming familiar with reflective thinking processes which lead to problem solving thought, (2) by understanding what constitutes a problem solving situation for students and by (3) acquiring a perspective of curriculum development that is based on a problem solving approach. (Jarvis, 1965) Some suggestions by Raths (1967) on specific ways to emphasize critical thinking in

the classroom utilizing the regular curricula are comparing, summarizing, observing, classifying, interpreting, criticizing, looking for assumptions, imagining, collecting and organizing data, hypothesizing, applying facts and principles to new situations, decision-making, and designing projects of investigation. Teacher behavior also exerts great influence over students' thinking through (1) the nature of questions asked, (2) what teachers give and seek from students, (3) which ideas are elaborated and which passed over, (4) points at which approval and disapproval are given, (5) the focus which the teacher sets determines points students can explore and establishes the models for thought they can practice, and (6) that the level of thought attained seems to be determined by the whole pattern of transactions and not by the natures of single acts. (Taba, 1964).

For children to think critically and become effective problem solvers, teachers must encourage and help students to (1) develop a questioning attitude and a sensitivity to problems, (2) consider all possible sources of information, (3) develop skill in gathering data including the ability to observe accurately, (4) use wise selectivity of ideas and information, (5) recognize relationships, especially in reorganizing previously acquired knowledge for new purposes, and (6) test ideas in action; failure to thus test ideas leaves students in the role of spectators. (Ellsworth, 1963).

The teacher's role in developing critical thinking skills of pupils must be an active one. One major way that a teacher can guide students' thinking is through the types of questions that are asked. Questioning will be most effective when the teacher understands the thought processes through which the student must progress through her

own experience. Questioning activates the thought process and critical thinking is highly influenced by the ability to ask the right question at the right time. Carner (1963) defines three levels of questioning as the concrete, the abstract, and the creative. Concrete questions result in a primary concern for observable, tangible, and obtainable details which do not usually require evaluation, judgment, or drawing conclusions. The learner's role in this type of questioning is absorbing details or properties of a specific learning situation as he answers questions asking "who," "what," "where," or "when," and material never proceeds beyond a literal meaning. Abstract questions require pupils to go beyond the specific level of comprehension in order to generalize, classify, or relate specifics into meaningful patterns and is best demonstrated by the "how" and "why" questions. Creative questions require answers on both the concrete and abstract levels of thinking and are characterized by reorganization of concepts into novel patterns. These are the open-end type questions and are exemplified by the "what if" question. The concrete question can be compared to cognitive memory the abstract to both convergent and divergent thinking, and the creative to divergent thinking.

Of all the methods that are known for solving problems in terms of human needs, values, and concerns, thinking represents the one best method available. Where there is freedom to think, there is also freedom to correct; where there is freedom to think, there is the possibility of new hypotheses being proposed; where there is freedom to think, ideas not yet heard may have opportunity to be heard, to be discussed, to be modified and to be tried. If training in critical thinking is to become an objective to be reached through teaching efforts, teachers themselves

must become proficient in the knowledge and use of the fundamentals of logic. Such knowledge and proficiency might be more easily acquired through the introduction of basic courses emphasizing critical thinking in teacher-training institutions. If there is commitment on the part of teachers to excellence in the educative process and to furthering the growth of children's ability to think critically, there seems to be a lack of commitment to mobilizing the resources which would help these teachers in the achievement of these purposes. If emphasis upon thinking is an objective, one would expect that the graduate schools, the colleges, and the trained supervisors would be helping the teachers day by day in very specific and concrete ways to build curricula that would reflect this emphasis on thinking. (Raths, 1967) If teaching for thinking is one of the main purposes of education, colleges and universities and their instructional staffs must take the initiative and, by themselves being models, prepare teachers to teach critical thinking and, in turn, to become models of critical thinking for their students.

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